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OPPORTUNITIES AND CONSTRAINTS OF VILLAGE CHICKEN PRODUCTION AROUND GONDAR TOWN

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SENIOR RESEARCH PROJECT REPORT SUBMITTED TO DEPARTMENT OF ANIMAL PRODUCTION AND EXTENSION, IN PARTIAL FULFILLMENT OF THE REQUIEEMENTS FOR BACHELOR OF SCIENCE DEGREE IN ANIMAL PRODUCTION AND EXTENSION

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LIST OF ABBREVIATIONS

NMA.....National Methodological Agency

EARO.....Ethiopian Agricultural Organization

FAO.....Food and Agricultural Organization

ILCA.....International Livestock Research Center for Africa

AACMC.....Australian Agricultural Consulting and Management Company

WLH.....White Leg Horn

RIR.....Rhode Island Red

GZWADO.....Gondar Zuria Woreda Agricultural Development Office

CSA.....Central Statistical Authority

SPSS.....Statistical Package for Social Science

NCD.....New Castle Disease

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ABSTRACT

This study was conducted around Gondar town from February 2015 to May 2015 to identify the constraints and opportunities of village chicken production around Gondar town at three villages (Chank, Ayira, and Kussikuam) by using semi structured questionnaire, field visit and interview from 45randomly selected respondents. The result revealed that the main constraints were feed shortage (15.56%), predation (24.44%) and flock mortality (60%). Respondents reported that they have been used chicken for meat (46.67%), Egg (24.44%), income source (20%) and fertilizer (8.89). The main opportunities for village chicken production were market access (42.22%), extension service (15.56%), feed and water access (20%), healthcare (8.89%) and housing (13.33%). In conclusion, constraints and opportunities of village chicken production were merely identified. Improving the management practices, poultry breeds and educating the framers are viable options to improve the livelihood of the households.

Key words: constraints, opportunities, respondents, Village chicken

1. INTRODUCTION

Poultry is the largest livestock species worldwide(Jens Christian *et al*. 2004) accounting for more than 30% of all animal protein consumption (Gueye, 1998).Chickens largely dominate flock composition and make up about 98 % of the total poultry. Ethiopia has large population of chickens estimated about to be 48.89 Million (CSA, 2011) with native chickens of non descriptive breed representing 96.6%, hybrid of chickens 0.55% and exotic breed of chickens mainly kept in urban and peril –urban areas 2.8% (CSA, 2011).

Village chicken production system in Ethiopia followed by primitive type with 5-20 birds per household is simple rearing in backyard with inadequate: feeding and health care. Village chickens are kept under a free range system ,and most of their nutritional requirement is fulfilled through scavenging (Dessie and Ogle, 2000;Desta and Wakeyo, 2012).Development of semi-intensive enterprises, particularly village chicken production, can be a useful way of helping to meet the nutritional, income, employment and gender needs of the rural population (Kusina and Kusina, 1999). Poor reproductive performance, poor growth rates, diseases, mortality, predation and lack of organized markets are some of the major constraints in smallholder chicken production (Muchenje and Sibanda, 1997). These have been compounded by the use of adaptable, but low performance breeds and shortage of feed resources (Kusina and Kusina, 1999).With the increase in population and rural urban migration, less emphasis on developmental issues is being directed towards the poor and economically inactive women, children and old aged who are the majority in rural areas (Bradley 1992). Although it is recognized that women and children are responsible for village chicken production, and control, access to benefits may not be exclusive to them (Kitalyi 1998).

1.1 statement of the problem

Poultry production and management practice in Gondar zuria district can be characterized by extensive poultry production system and the production and productivity of village chicken is low due to flock mortality by disease, predator and poor management practice. In the district; the poultry population approximately is 169,282(GZWADO, 2004). Even if the population is high, the farmers have not benefited from the sector, because of traditional production system, predator challenge, disease prevalence, feed shortage and poor management practices (GZWADO 2004). Therefore, this study is designed to assess the opportunities and constraints of poultry production in the study area.

1.2 Objectives

- **General objectives**

  - To identify the major constraints and possible opportunities of village chicken production around Gondar town

- **Specific objectives**

  - To asses constraints of village chicken

  - To determine the management and extension service of village chicken

  - To identify opportunities for village chicken production

1.3 Research question

- ✓ What are constraints of village chicken?
- ✓ What are the management and extension service of village chicken?
- ✓ What are the opportunities of village chicken production?

2. LITERATURE REVIEW

2.1. Overview of poultry production in Ethiopia

The word poultry refers to all domesticated birds that are reared for the production of meat and Eggs for human consumption as well as for economic benefits. It includes chickens, turkeys, Ducks, geese, quails, guinea fowls and other domesticated birds (Singh, 2000). In Ethiopia, however, the word poultry is synonymously used with the word chicken. Turkeys and ducks, which at present are rare, were introduced to Ethiopia by foreigners (EARO, 1999). There is no recorded information which indicates when and by whom the first batch of exotic breeds of Chicken were introduced to Ethiopia. It is widely believed that missionaries imported the first exotic breeds. However, over the past few decades, many exotic breeds, including the White Leghorn (WLH), Rhode Island Red (RIR), New Hampshire and Cornish have been introduced in to the country by different government and non-governmental organizations and/or Institutes. Despite a number of intensive production systems with modern strains for egg and broiler Production, up to 98.5 % and 99.2 % of the national egg and poultry meat production (AACMC, 1984) is still obtained from traditional chicken production systems, with an average annual Output of 72300 metric tons of meat and 78000 metric tons of eggs (ILCA, 1993).

2.2. Production and reproduction performances of village chicken

The productivity of village chicken production systems in general and the free range system in particular is low (Kondombo, 2005). This is due to low egg production and high mortality rate (Nigussie *et al*. 2003). Teketel (1986) and Aberra (2000) also characterized the low productivity of local chicken due to low egg production performance, production of small sized eggs, slow growth rate, late maturity, small clutch size, an instinctive inclination to broodiness and high mortality of chicken.

In Ethiopia, a local scavenging chicken on average lays about 36–40 eggs/year (Tadelle *et al.* 2000; FAO 2004). The average egg weight of local hens around Arsi, Ethiopia, was reported to be 38 gm (Brannang and Persson, 1990). According to Sonaiya *et a*l. (1998), Aini (1990) and Gueye (2000), the annual egg production of chicken in village conditions ranged from 20 to 100 eggs; with an average egg weight range of 30 to 50 gm. According to Gueye (2000), the adult male and female weight of African village chicken ranges from 1.2 to 3.2 kg and from 0.7 to 2.1 kg, respectively.

2.3. Challenges and opportunities of chicken production in Ethiopia

Indigenous chickens provide major opportunities for increased protein production and income for smallholders (Sonaiya, 1997). Chickens have a short generation interval and a high rate of mortality and are relatively affordable and consumed by the rural people as compared with other farm animals such as cattle and small ruminants. Chicken also play a complementary role in relation to other crop-livestock activities. Indigenous chickens are good scavengers as well as foragers and have high levels of disease tolerance possess good maternal qualities and are adapted to harsh conditions and poor quality feeds as compared to the exotic breeds. In some communities, village chickens are important in breaking the vicious cycle of poverty, malnutrition and disease (Roberts, 1992).

In Ethiopia, however, lack of knowledge about poultry production, limitation of feed resources, prevalence of disease as well as institutional and socio-economic constraints (EARO, 1999; Ashenafi et al., 2004) remain to be the major challenges in village based chicken productions.

2.3.1. Feeding

Family poultry production in Africa survives by scavenging and generally, no supplements provided except that some times, household waste fed to the birds and other circumstances the diet supplemented with grain (Dwinger *et al*., 2003). Similarly, in Ethiopia the smallholder chicken production system is characterized by keeping under free range system and the major feed sources are believed to be insect worms, seed and plant materials (Tadelle and Ogle, 1996a; Solomon, 2004).

One of the major production constraints to the development and growth of the rural family poultry in most developing countries is the estimation of feed intake and feed utilization under scavenging conditions. Such data will provide the basis for improvement in feeding management, in terms of supplementary feeding and stocking density or birds per unit scavenging area (Gunaratne *et al.*, 1993). However, the crop analysis result indicated that the physical proportion of seeds was higher in the short rainy season and the concentration of crude protein; calcium and phosphorus were below the recommended requirements for egg production and the diet are also unbalanced (Tegegne, 1992; Tadelle and Ogle, 1996b; Alemu and Tadelle, 1997). This limited resource feed restricts the potential productivity of local birds to 40-60 eggs per hen per year. Both egg production and egg size vary with season, as the quality and availability of feed varies (Mbugua, 1990). According to the finding of Tadelle and Ogle (1996b), the feed resource is deficient in protein, energy and probably calcium for layer birds, and this is confirmed from the results of supplementation trial, which show that supplementation of local birds with feed sources containing energy, protein and a calcium source brings a considerable increase in egg production.

2.3.2. Housing

Although no data are available about housing at national level, the local birds are set free on free range whereby they move freely during the day and spend the night in the main house. Overnight housing, perched in trees or on roofs and overnight housing within the main house are the common patterns of housing prevailing in the country. Lack of housing is one of the constraints of the smallholder poultry production system. Some research works also indicated that the mortality of scavenging birds reduced by improved housing. For instance, in the Gambia livestock improvement program, which included improved poultry housing resulted in lower chick mortality (19%) relative to that observed in Ethiopia (66%) and Tanzania (33%), where no housing improvements were made (Kitalyi, 1998).

2.3.3. Disease and predators

The indigenous flocks are said to be disease resistant and adapted to their environment. However, the survival rates of the Ethiopian indigenous chicken kept under natural brooding conditions considered low. Disease and predators are known to be the major causes of mortality in the country (Holye, 1992; Negussie, 1999). According to Negussie and Ogle (1997), New castle disease accounted for the largest proportion of overall flock mortality to be 57.3% followed by fowl pox 31.6%, coccidiosis 9.4% and predator loss 1.7%. The prevalence of fowl cholera was considerably higher in the mid-altitude (53.3%) while fowl typhoid was a major problem in low altitudes accounting for 57% of the overall mortality. Predators such as snakes, rats, dogs, cats and foxes are the main causes of losses especially in young birds.

Thefts are also another important cause for the loss of adult birds. According to Aberra (2007), about 46% of the respondents in Southern Ethiopia reported, that wild birds (eagle, hawk, etc.) are the most common predators during the dry season, while wild cat (locally known as Shelemetmat) is the most dangerous predator during the rainy season.

2.3.4. Marketing

Poultry marketing structure has not well studied in Ethiopia. The market outlets or channels available to producers are diverse at all markets, although their importance differs across markets. The major channels through which producers/farmers sell their chicken in the markets are direct sold to consumers and/or to small retails that take the chicken to large urban centers (Kena *et al*., 2002). However, the smallholder farmers do have little knowledge on how the market works and why price fluctuates and have virtually no information on market conditions (Sonaiya, 2000). Thus, most farmers sell chickens within their vicinity. This can attribute to the small number of chickens offered for sale, long distance to the high demanding urban and peri urban markets and that selling of chickens is occasional and based on prevalent pressing needs of the family (Kena et al., 2002).In most cases, traders use public transportation (buses and minibuses) or hire space in private trucks to transport chicken to terminal markets. During transportation, the chickens may be kept along with other bags sacks of grain bundles of firewood etc by binding their legs together that can result in

considerable lose due to stressful conditions (Kena, 2002). The marketing aspects of the smallholder poultry production often marginalized by policy-makers and development workers.

2.3.5 Extension interventions

Improvements of the genetic potential of the local chicken have done through selection within and/or up grading with exotic breeds. The intention of this scheme was to enable farmers to handle pure breeds as well as crossbreed chicken. Unfortunately, no systematic effort was made to evaluate performance of this scheme. Moreover; they were not compatible with the socio-economic circumstances in the village chicken production system. This is mainly because ownership pattern, control and access of resources, distribution of benefits and marketing are issues that have not been adequately addressed in the process of interventions (Sonaiya, 1990a). Over the last decades, government extension has been exercising to disseminate dominantly white leghorn and RIR as a poultry extension package to improve both production and productivity of local chickens. However, experience indicated that the poultry extension packages launched by the government are not properly evaluated. Lack of recorded data on the performance of chickens and in all aspect of managements makes difficult to assess the importance and contributions of the past attempt to the sector.

3. MATERIALS AND METHODS

3.1. Description of the study Area

The study was undertaken around Gondar town and nearby three villages in North Gondar Administrative Zone of Amhara Region, Ethiopia Gondar town which is located in the north western part of Ethiopia and it has varied landscape, dominantly covered with ragged hills and plateau formations, and imparts variable temperature. Gondar is an old town established in 1636 by fusillades.

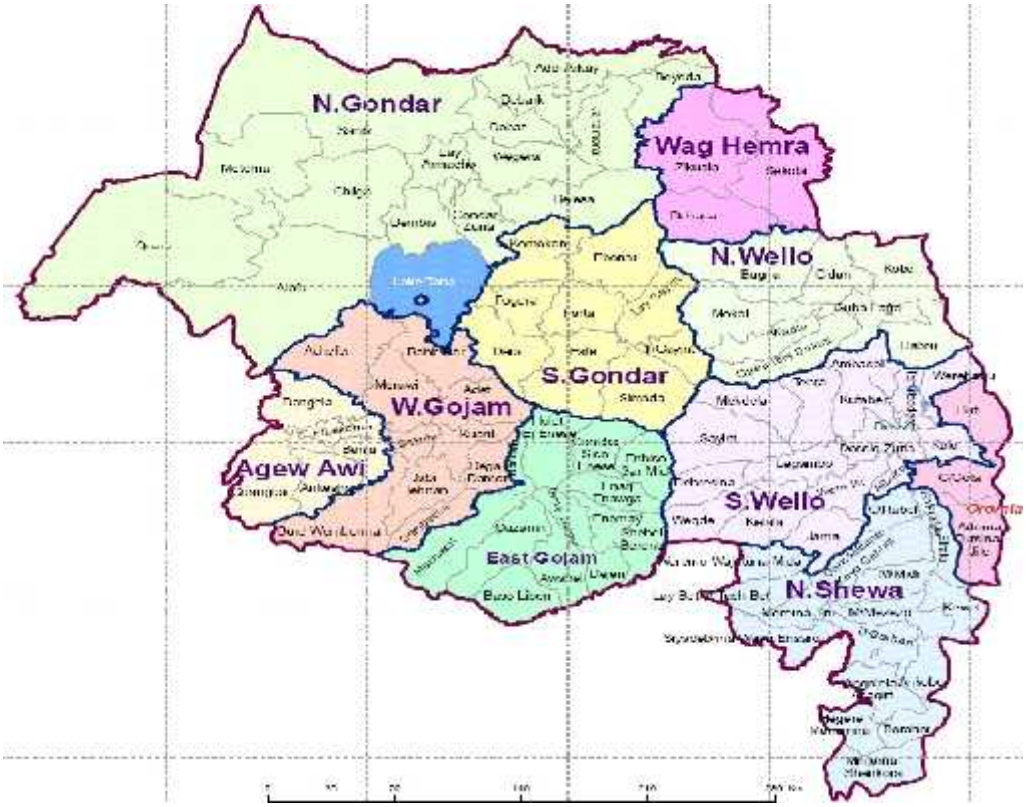

Figure 1: M**ap description of north Gondar in Amhara region**

3.2. Location and climate of the area

The study was conducted around Gondar town, located in the north-western part of Ethiopia. Study area is located 738km northwest of the capital, Addis Ababa. The study zone is located between geographical coordinates 12.3º to 13.38º north latitudes and 35.5º to 38.3º east longitudes and the altitude ranges from 550 to 4620 meters above sea level which is

randomly and independently distributed with in western lowland and in north Semen Mountain respectively. The average annual rain fall varies from 880mm to 1772 mm, which is characterized by monomodal type of distribution. Minimum and maximum temperatures are 10ºC in highland and 44.5ºC in the lowland (NMA, 2011).

3.3. Methods of data collection

The data was collected by using semi-structured questionnaire, field visit and interview on 45 randomly selected respondents in three villages (Chank, Ayira, and Kussikuam). Major constraints and opportunities of village chicken production were collected. In addition to these, feeding system, housing condition, marketing, health care, and extension services were collected as a primary sources.

3.4. Data analysis and presentation

The raw data was managed using excel spread sheet and it was analyzed using SPSS 17 software. Since our data was qualitative we used descriptive statistics (such as frequency and percentage) to summarize the raw data.

4. RESULT AND DISCUSSION

4.1 Demography of respondents

Fourteen (31.1%) of respondents were under 20 years whereas 31 (68.67%) of them were above 20 years. Among the respondents, 12 (26.67%) were males and 31 (73.3%) were females. From respondents, 16 (35.5%) were literacy and 29 (64.44%) were illiterate.

Table 1: Characteristics of the respondents

Category		Number of respondent			
		Chank (%)	Ayira (%)	Kussikuam (%)	Total (%)
Age	<20	3(20%)	5(33.33%)	6(40%)	14(31.11%)
	>20	12(80%)	10(66.67%)	9(60%)	31(68.67%)
Sex	Male	6(40%)	4(26.67%)	2(13.33%)	12(26.67
	Female	9(60%)	11(73.33%)	13(86.67%)	33(73.33%)
Education level	Literacy	5(33.33%)	7(46.67%)	4(26.67%)	16(35.56
	Illiteracy	10(66.67%)	8(53.33%)	11(73.33%)	29(64.44%)

4.2. Importance of village chicken production

The main importance of village chicken production in the study area was for meat source (46.67%), egg source (24.44%), income source (20%) and fertilizer (8.89%) (Table 2).This in line with Singh (2000) to all domesticated birds (chicken) that are reared for the production of meat and eggs for human consumption as well as for economic benefits .

Table 2: Frequency of respondents regarding importance of village chicken production

Importance of chicken	Number of respondent			
	Chank (%)	Ayira (%)	Kussikuam (%)	Total (%)
Egg	4 (26.7%)	2(13.33%)	5(33.33%)	11(24.44%)
Meat	7(46%)	5(33.33%)	9(60%)	21(46.67%)
Income source	3(20%)	5(33.33%)	1(6. 67%)	9(20%)
Fertilizer	1(6.67%)	3(20%)	0(0%)	4(8.89%)

4.3 Supplementary feeding

The majority of respondents (62.22%) were reported that they have provided grain feeds as supplementary feed followed by food leftover (24.44%) and only 13.33 % of respondents were provided kitchen waste for their chickens (Table 3). This implied that producers have awareness about supplementary feed, however; the chicken production system is still traditional. Our finding is inconsistent with the report of Tadelle and Ogle (1996a) and Solomon (2004) in Ethiopia who stated that the smallholder chicken production system is characterized by keeping under free range system and the major feed sources are believed to be insect worms, seed and pant materials.

Table 3: The percentage of respondents that had been given a supplementary feed for chicken

Types of supplementary feed	Number of respondent			
	Chank (%)	Ayira (%)	Kussikuam (%)	Total (%)
Grains	7(46.67%)	10(66.67%)	11(73.33%)	28(62.22%)
Food leftover	5(33.33%)	4(26.67%)	2(13.33%)	11(24.44%)
Kitchen waste	3(20%)	1(6.67%)	2(13.33%)	6(13.33%)

4.4. Breed type & number of chicken

The majority of chicken breed in the study area were local breeds (61%) followed by cross breed (29%) and exotic breed (10.33%). The respondents mostly prefer local breeds due to disease resistance. This result was nearly similar with Robbers (1992) report which described that the indigenous chicken are good scavengers as well as foragers and have high levels of disease tolerance possess good maternal qualities and are adapted to harsh conditions and poor quality feeds as compared to the exotic breeds.

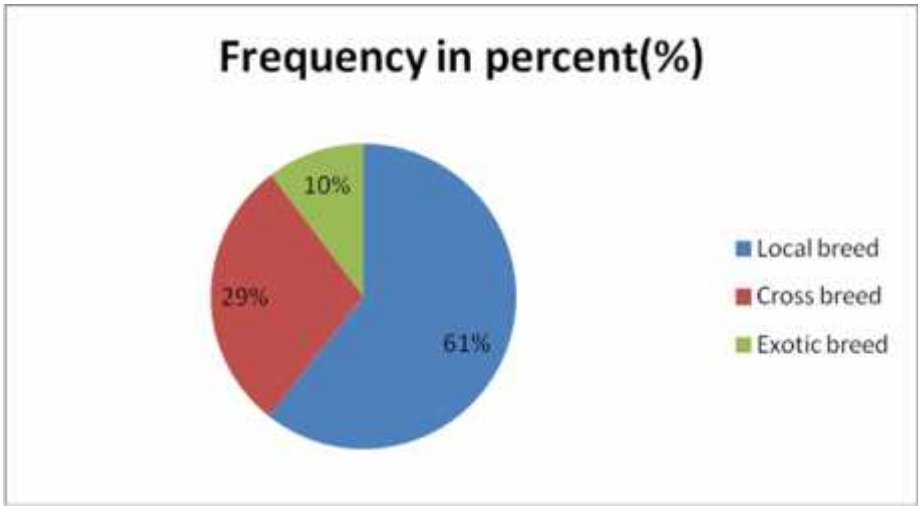

Figure 2: Breed type of village chicken

4.5 Causes of Chicken Morality

The result revealed that 64.44% of the death were due to disease such as new castle disease (NCD) and coccidiosis, which followed by the predators (22.22%) . Whereas the minimum death was observed by animal trampling effects was 13.33%. This result similar with the Author of (Holye, 1992; Negussie, 1999), Disease & predator are known to be the major causes of mortality in the country. Predators such as snakes, rats, dogs, cats and foxes are the main causes of losses especially in young birds.

Table 4: Major causes of chicken mortality

Causes of mortality	Number of respondent				Percent (%)
	Chank	Ayira	Kussikuam	Total	
Predator	5(33.33%)	3(20%)	2(13.33%)	10	22.22(%)
Disease	8(53.33%)	9(60%)	12(80%)	29	64.44(%)
Animal trapping	2(13.33%)	3(20%)	1(6.67%)	6	13.33(%)

4.6 Constraints of village chicken production

As indicated in Fig. 3, flock mortality was reported to be the major constraint (60%) that faced by producers. Farmers had suffered serious losses due to flock mortality. The other constraints include predators (24.44%) and feed shortage (15.56%). The result is in line with the findings of EARO (1999) and Ashenafi *et al*. (2004) who reported lack of knowledge about poultry production, limitation of feed resources, prevalence of disease as well as institutional and socio-economic constraints were the major challenges in village based chicken production.

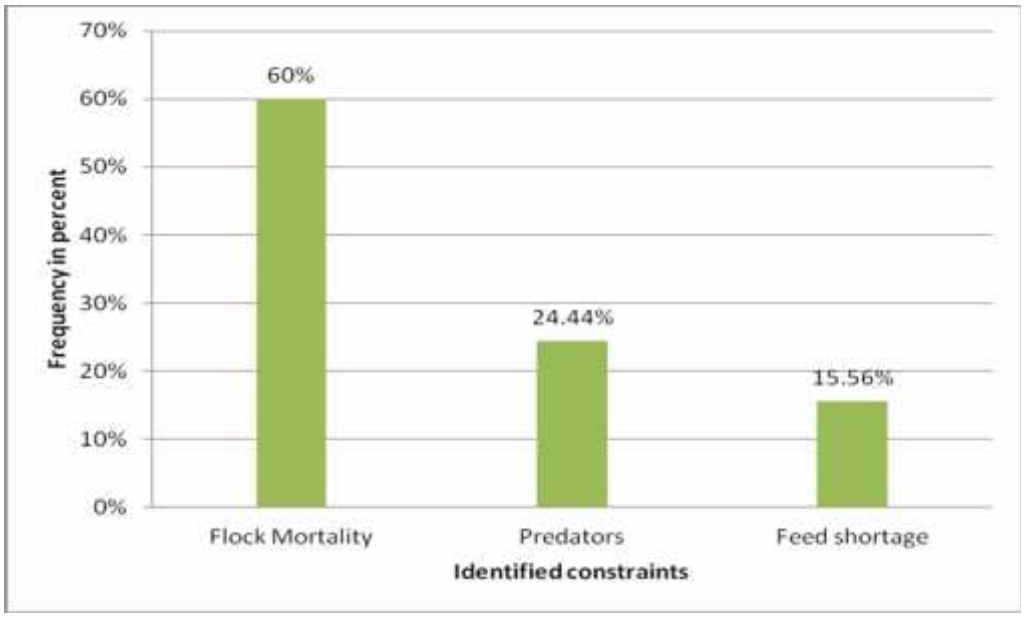

Figure 3: Constraints of village chicken

4.7. Opportunity of village chicken productions

Even if; there were many problems in the study area there were also some opportunities to improve village chicken production and productivity for the future such as market availability, feed access, extension service, housing and healthcare. In Figure 4, market was the primary opportunities (42.22%) and followed by feed access (20%), extension service (15.56), housing (13.33) and healthcare (8.89%). The` result disagrees the finding of Sonaiya (1990a) who stated that ownership pattern, control and access of resources, distribution of benefits and marketing are issues that have not been adequately addressed in the process of interventions. Over the last decades, Ethiopian government has been exercising extension services to disseminate improved chicken like white leghorn and RIR as a poultry extension package to improve both production and productivity of local chickens.

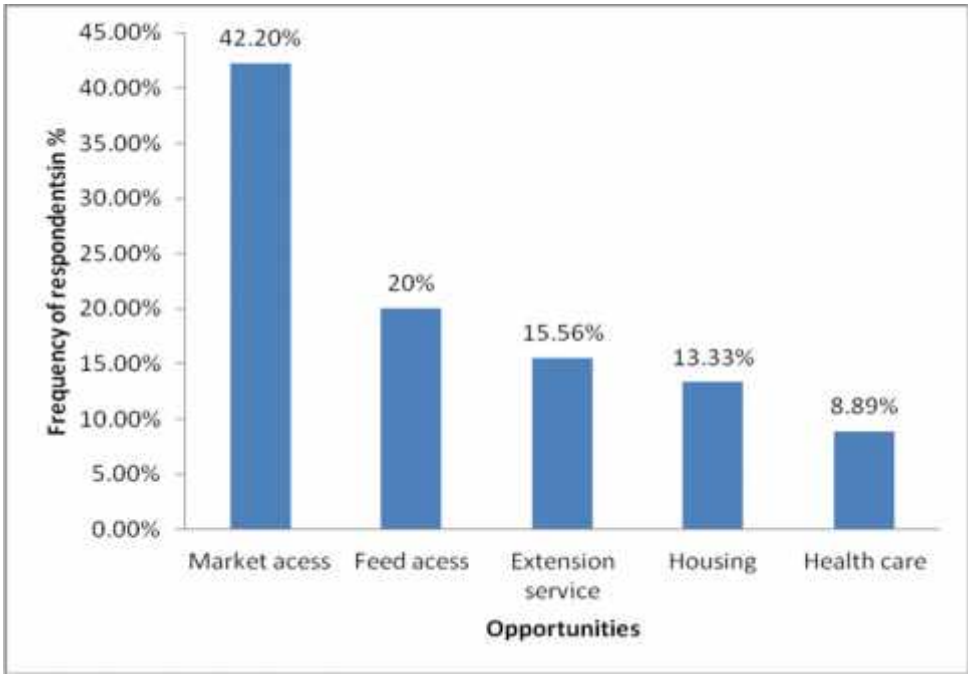

Figure 4: Opportunities of village chicken

5. Conclusion and Recommendation

In our study area, village chickens are raised under traditional management practice with many problems such as feed shortage (15.56%), predation (24.44%) and flock mortality (60%). On the other hand; market availability (42.22%), extension service (15.56%), feed and water access (20%), housing (13.33%) were some of the opportunities indentified in the area. Better understanding of these constraints and good prospects of village chicken production is important to improve food security and improves the standard of living condition of the farmers. Therefore, based on the result the following recommendations are forwarded:

- Farmers and other concerning bodies should give attention for increasing extension services
- Owners and other concerning bodies should pay strong attention for appropriate intervention for disease and predator to improve chicken product and productivity
- The producers should provide adequate quality and quantity of feeds in regular manner for better production performance of chickens and less prone to disease.
- The agricultural office and producers should work in collaborating in the area of diseases and predator control, feed and breed improvement and other management aspects.
- Further research should be conducted to educate farmers, improve breeds and management aspects to solve the existing village chicken production.

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7. ANNEXES

A. Information on owner

1.Name ……..

2 .age A) below 20 B) above 20

3 .Sex A) male B) female

4.kebele……

5. Education level A) literacy B) illiteracy

B.Information on animal

6. Number of chicken and breed type ? A) Local breeds…… B) Cross breed…… C) exotic breed……..

7.Major importance of village chicken A) sale(income source) B) meat C) egg D) fertilizers

C.Feeding

8. Do you give supplement feed to your chicken?

8.1 If yes, which types of supplementary feed?

A) Grains (maize, wheat, barley etc)

B) Food left over

C) Kitchen waste

D) Other, specify

8.2 If not provide supplementary feed, why?

1=Not accessible 2=Expensive 3= lack of awareness 4 =others, specify

9. Is there feed shortage/constraint for your chicken? 1=Yes 2=No

9.1 If yes, when? 1=Dry season 2=Wet season 3=both

9.2 If feed shortage in your locality, why? (Ran

D.Watering

10. Is there any water shortage/problem to your chicken? 1=Yes 2=No

10.1 If yes, when? 1=Dry season 2=Wet season 3=both

11. Why shortage of water? (Rank)

1=Drying of water sources 2=Far distant from water sources

3=Not allowed to use sources

E.Disease

12. What are the common diseases that affect health and production of chicken?

13. What would you do when your chicken sick?

1=Treat with veterinary practices 2=Sales immediately

3=Slaughters immediately

14. From where you usually obtain veterinary services1=GO 2=NGOs 3=Private institution

F. Marketing

15. Do you face any problem in marketing of your chickens? 1= Yes 2= No

24.1 If yes, what? (Rank)

1= Seasonality of market

2= Lack of market and price information 3 = market fluctuation 4=Others, specify

G.Production and management

15. What are major constraints of chicken production in this area? (Rank)

1=Disease 2=Feed shortages

3=Water shortage 4=Drought 5=Predators

6=Marketing problems 7=Inadequate/lack of inputs

8= Inadequate/lack of extension and support

9=Inadequate/lack of technologies and innovations

16. Have you received any improved management practices?

1=Yes 2=No

16.1. If yes, where you obtained?

1= extension services 2=Community leaders

3=Market participant farmers 4=intervention

5=Relatives and friends 6=Radio, television, news letter 7= Others

H. Housing

17. Are your birds housed? 1= Yes, day and night 2= Yes, in the night only 3= No

17.1 If your birds are housed, please describe the housing type? a. Simple construction with on farm material b. Simple construction with purchased material c. Others

17.2 If your birds are not housed, give a reason a. Not enough money to construct b. Not necessary.

I. Chicken mortality

18. is chicken mortality a problem in your flock? Yes / No

19. If yes, which kind of birds mostly died?

1=Adults 2.growers 3. Chicks

20. In your flock, what is the most important reason for death/losses of Adult birds, Growers and Chicks? A. disease B. predator's C. shortage of feed others D) animal trapping

8. DECLARATION

We, the under signed, declare that the information presented here in our senior research project is our original work has not been presented for degree in any other university and that all sources of materials used for the research and report have been dully acknowledged

Name:.....

Signature:.....

Date of submission: .....

This thesis has been submitted for examination with my approval as university advisor

Name:.....

Signature:.....